IN THE

Supreme Court of the United States

STATE OF WISCONSIN, STATE OF MINNESOTA, STATE OF OHIO, and STATE OF PENNSYLVANIA, *Complainants,* *vs.* STATE OF ILLINOIS and THE SANITARY DISTRICT OF CHICAGO, *Defendants.* STATE OF MISSOURI, STATE OF KENTUCKY, STATE OF TENNESSEE, STATE OF LOUISIANA, STATE OF MISSISSIPPI, and STATE OF ARKANSAS, *Intervening Defendants.*	No. ~~3~~ 3, Original.
STATE OF MICHIGAN, *Complainant,* *vs.* STATE OF ILLINOIS and THE SANITARY DISTRICT OF CHICAGO, et al., *Defendants.*	No. ~~4~~ 4, Original.
STATE OF NEW YORK, *Complainant,* *vs.* STATE OF ILLINOIS and THE SANITARY DISTRICT OF CHICAGO, et al., *Defendants.*	No. ~~5~~ 5, Original.

SEMI-ANNUAL REPORT OF THE SANITARY DISTRICT OF CHICAGO OF JULY 1, 1937, MADE PURSUANT TO DECREE OF APRIL 21, 1930.

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NOS. 5, 8 AND 9, ORIGINAL.

OCTOBER TERM, 1936.

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SEMI-ANNUAL REPORT OF THE SANITARY DISTRICT OF CHICAGO OF JULY 1, 1937, MADE PURSUANT TO DECREE OF APRIL 21, 1930.

Pursuant to provisions of paragraph numbered 5 of the Decree in the above entitled causes, entered on April 21, 1930, the Defendant, The Sanitary District of Chicago, hereby makes its semi-annual report of July 1, 1937, as follows:

CONSTRUCTION PROGRAM.

In the semi-annual report of January 1, 1937, the status of completed work in the sewage treatment construction program involved in this case was stated to be on December 1, 1936, as follows:

TABLE 1.
COMPLETED WORK AS OF DECEMBER 1, 1936.

Calumet Project	$ 29,113,277.54
North Side Project	37,625,183.73
West Side Project	52,076,355.45
Southwest Side Project	10,446,684.05
West-Southwest Treatment Plant	5,043,939.78
Miscellaneous Plants and Sewers	632,961.20
Chicago River Controlling Works	345,678.37
Total	$135,284,080.12

TABLE 2.
FUTURE WORK AFTER DECEMBER 1, 1936.

Calumet Project	$ 5,929,000.00
North Side Project	4,593,000.00
West Side Project	1,603,000.00
Southwest Side Project	26,588,000.00
West-Southwest Treatment Plant	21,899,000.00
Miscellaneous Plants and Sewers	1,000,000.00
Chicago River Controlling Works	2,546,000.00
Total	$64,158,000.00

During the six months between the date of the last report and the present report a considerable amount of construction work has been accomplished on the Calumet, the North Side, the West Side and the Southwest Side Sewage Treatment Projects and on the Chicago River Control Works.

Calumet Project. The sewage treatment works and the sludge disposal plant have been completed and have been in service for more than a year. Minor changes and adjustments are being made, to increase the operating efficiency.

Construction of sewers in the Calumet region has been continued. The South Park Avenue and the Col-

fax Avenue sewers have been completed and are now in service. Construction of the Calumet City sewer is now 60 per cent completed. A contract for the construction of a small pumping station to pump the Calumet City sewage was awarded January 28, 1937 and this work is now 27 per cent completed. The studies made on the Stony Island Avenue sewer project have resulted in a decision to abandon this project and substitute therefor additional pumps in the Ninety-fifth Street pumping station, which will develop sufficient added flow capacity in certain existing sewers equal to that expected from the proposed Stony Island Avenue sewer.

On April 16, 1937 a change was made in the agreement of September 21, 1935 between the Sanitary District and the Federal Emergency Administration of Public Works, by which funds were made available for the construction of the Blue Island intercepting sewer. It is expected that a contract will be let for this work within the next three months. Certain WPA projects are under way in the areas to be served by the Evergreen Park and California Avenue-Oak Forest sewers, which will eliminate the necessity of constructing these sewers within the next few years. The Sanitary District is assisting in these WPA projects. The Evergreen Park and California Avenue-Oak Forest sewers are therefore eliminated from the future construction to be completed by the end of 1938.

North Side Project. The construction of additional Final Settling Tanks, etc., for the North Side Treatment Works is now 95 per cent completed and some of the additional tanks have been placed in service.

Plans are being prepared for certain miscellaneous improvements at the sewage treatment plant, for certain siphons under the North Shore Channel and for a sewer in Niles.

The extension of the North Side Treatment Works and the construction of the Howard Street and the North Shore Intercepting sewers are at this time eliminated from the construction program to be completed before the end of 1938. Experience in operating the treatment plant and a reduction in the detention period of the sewage for aeration indicate that this portion of the plant has far greater capacity than was considered possible in 1928. The additional final settling tanks, now being placed in service, and the other miscellaneous improvements, soon to be made, should give this treatment plant ample capacity for the next few years. The construction of the Howard Street and North Shore Intercepting sewers can be deferred, for the reason that the territory which they were expected to serve has not yet developed to an extent which would justify the expense of their construction.

West Side Project. Construction was continued on three collateral intercepting sewers. The construction of the sewer from Harrison to Taylor Street and of the Goose Island sewer has been entirely completed. The construction of the Halsted Street sewer is now 97 per cent completed.

The remaining work in the West Side Project, dependent upon future financing, consists of certain collateral sewers and sewer connections in the area adjacent to the Main Drainage Channel west of West-

ern Avenue and of facilities for the secondary (or complete) treatment of sewage at the West Side Works. A contract for an Experimental Plant, to determine the advantages of certain chemical processes on the effluent from the West Side Imhoff Tanks, was awarded March 25, 1937.

Southwest Side Project. Construction was continued on the following contracts for the Southwest Side Intercepting Sewer, mentioned in the last semi-annual report to the Court: Contract Section 1, now 100 per cent completed; Contract Section 4, now 100 per cent completed; Contract Section 5, now 74 per cent completed; Contract Section 6, now 13 per cent completed; and Contract Section 7, now 66 per cent completed.

The contract for the construction of Section 9, Miscellaneous Sewer Connections, was awarded May 6, 1937.

On April 16, 1937 a change was made in the agreement of September 21, 1935 between the Sanitary District and the Federal Emergency Administration of Public Works, by which funds were made available for the construction of that portion of the Racine Avenue pumping station which is essential for the proper operation of the Southwest Side Intercepting sewer. It is expected that a considerable amount of this work can be placed under contract before the end of 1937.

Construction was continued on the following contracts of the Upper Des Plaines Intercepting Sewer: Contract Section 1, now 100 per cent completed; Con-

tract Section 2, now 89 per cent completed; Contract Section 3, now 100 per cent completed and Contract Section 5, now 100 per cent completed. Plans and specifications for the small pumping station for the Upper Des Plaines Sewer are now approximately 75 per cent completed. A contract for the connections to the Upper Des Plaines Sewer was awarded April 29, 1937 and this contract is now 4 per cent completed. The change in the PWA agreement, made April 16, 1937, provided for the construction of a short extension of the Upper Des Plaines sewer to the north. This work will be designated as Contract Section 8.

Construction was continued on the West Towns Outlet Sewer and Contract Section 1 is now 99 per cent completed and Contract Section 2 is now 100 per cent completed. A contract for the construction of the Outfall Structure for the West Towns Outlet Sewer was awarded January 14, 1937 and this work is now 77 per cent completed. The contract for the construction of the Argo Sewer, from the Southwest Sewage Treatment Works to Natchez Avenue is now 42 per cent completed. The change in the PWA agreement, made April 16, 1937, provided for the construction of the extension of the Argo sewer to Argo.

West-Southwest Treatment Plant. Construction was continued on the following contracts mentioned in the last semi-annual report to the Court: Aeration Tanks, Operating Galleries, Final Settling Tanks, etc., now 95 per cent completed; Electrical Work in connection with Aeration Tanks, etc., now 88 per cent completed; Architectural Work of the Pumping Sta-

tion and Blower House, now 100 per cent completed; Erection of Machinery and Auxiliary Equipment now 51 per cent completed; Electrical Work in the Pumping Station, now 8 per cent completed; Main Influent and Effluent Conduits, now 91 per cent completed; and Pump Discharge Chamber and Plant Outfall now 97 per cent completed.

The fabrication of the following equipment was continued: Steam Turbine driven Pumping Units, now 98 per cent completed; Steam Turbine driven Blower Units, now 96 per cent completed; Sludge Removal Mechanisms, now 97 per cent completed; Venturi Meters, now 99 per cent completed; Diffuser Plates, now 100 per cent completed; Meters, Valves and Sluice Gates in connection with Effluent Conduits, now 72 per cent completed; Steam Turbine driven Generator Units, now 99 per cent completed; Transformers, now 93 per cent completed; Condensers, now 54 per cent completed; Boiler Feed Water Heaters, now 91 per cent completed; Boilers and Settings; Heat Exchangers; Ash handling Equipment; Preliminary Tank Mechanisms; and Vacuum Filters, now 22 per cent completed.

A contract for the construction of the Preliminary Settling Tanks was awarded January 14, 1937 and the work is now 21 per cent completed. A contract for Electrical Work in connection with the Preliminary Tanks was awarded March 18, 1937. A contract for Structural Steel of the Incineration Plant was awarded April 1, 1937. A contract for the construction of the Substructure of the Sludge Dewatering and Incinerating Building was awarded June 17,

1937. Contracts for Coal and Sludge Conveying Equipment and for Sludge Drying Equipment were awarded June 17, 1937.

At the present time, 76 per cent of the 400 MGD West-Southwest Sewage Treatment Plant has been placed under contract and 47 per cent of the total plant has been completed.

Control Works Chicago River. The contract for construction of the Lock, Guide Walls, etc., comprising about 75 per cent of the entire Control Works project, is now approximately 33 per cent completed. The contract for Electrical Work in connection with the Lock is now 2 per cent completed. Plans are being prepared for the Cross Walls connecting the lock with the shore and for the Control Gates.

Financial. The financial condition of The Sanitary District of Chicago has changed little since the time of the last semi-annual report to the Court. The local tax situation has not improved. The amounts of taxes extended for the Sanitary District for the years 1928 to 1935, inclusive, and the amounts collected up to May 14, 1937, pursuant to these extensions, are as follows:

Year	Total Taxes Extended	Amount Collected	Amount Unpaid	Percentage Unpaid
1928.....	$ 19,448,392.46	$ 17,493,851.75	$ 1,954,540.71	10.05
1929.....	24,466,998.58	20,757,364.80	3,709,633.78	15.16
1930.....	22,453,699.40	17,893,799.05	4,559,900.35	20.31
1931.....	20,517,561.90	15,991,271.24	4,526,290.66	22.06
1932.....	19,281,643.24	13,914,904.09	5,366,739.15	27.83
1933.....	18,037,167.48	13,071,910.76	4,965,256.72	27.53
1934.....	21,163,009.22	15,123,519.86	6,039,489.36	28.54
1935.....	16,068,908.60	11,111,690.10	4,957,213.50	30.85
	$161,437,380.88	$125,358,311.65	$36,079,069.23	22.35

The amount, $125,358,311.65, shown in the foregoing table, is the amount of Sanitary District taxes collected by the County Collector. Of this amount $121,381,977.00 has been turned over to the Sanitary District. The taxes turned over to the Sanitary District since the time of the last report to the Court amount to $5,676,233.01, which is about 3.5 per cent of the taxes levied and due. The bonds of the Sanitary District now outstanding amount to $133,322,390. It is expected that $2,018,000 of bonds will be redeemed July 1, 1937, leaving $131,304,390 outstanding. This is still considerably in excess of the bonding capacity of the Sanitary District, which at present amounts to $119,915,555.

Progress of Work. The total work accomplished by The Sanitary District of Chicago in the construction of sewage treatment works during the period from December 1, 1936 (the date of the summaries for the last report) to June 1, 1937 (the date of the summaries for this report) as measured by construction expenditures was, as follows:

TABLE 3.

Calumet Project	$ 579,130.36
North Side Project	193,765.64
West Side Project	486,072.91
Southwest Side Project	3,915,588.38
West-Southwest Treatment Plant	1,407,673.75
Chicago River Controlling Works	334,448.67
Total	$6,916,729.71

In addition to the amounts shown in Table 3, approximately $1,493,000 had been earned by contractors up to June 1, 1937, on the various items of construction work, but had not been paid, being retained by the Sanitary District as reserved percentage until the final completion of the contracts.

By adding the various items indicated in Table 3 to corresponding items in Table 1, the completed portion of the sewage treatment construction program on June 1, 1937, was as follows:

TABLE 4.
COMPLETED WORK AS OF JUNE 1, 1937.

Calumet Project	$ 29,692,457.90
North Side Project	37,818,949.37
West Side Project	52,562,428.36
Southwest Side Project	14,362,272.43
West-Southwest Treatment Plant	6,451,613.53
Miscellaneous Plants and Sewers	632,961.20
Chicago River Controlling Works	680,127.04
Total	$142,200,809.83

At this time, eighteen months in advance of the date of the ultimate reduction in the diversion of water from Lake Michigan under the decree of the Court of April 21, 1930, it is proper to submit a revised estimate of the cost of the essential construction work remaining to be performed. The original program, outlined in 1928, contained many items which have been materially altered during the course of the past nine years. It also contained some items which, in the light of present day knowledge of the art of sewage treatment and of the growth of the community, could have been omitted.

In 1928, near the close of an era of prosperity and a period of rapid growth of the community, certain items were included as essential items, which now are known to be not essential. This change in conditions has been brought about partly by natural causes and partly because of the recent prolonged depression. Items were included for a number of sewers in outlying sections suburban to Chicago, which are not yet necessary and probably will not be needed till after

1940 because there has been little building in these communities for the past six years and there is no prospect for a revival of building in the near future. For this reason the following sewers can now be eliminated from the program:

Calumet:

Westerly section of Blue Island Intercepting Sewer	$ 510,000
California Ave.-Oak Forest Sewer	1,000,000
Evergreen Park Sewer	580,000

North Side:

Howard Street Sewer	2,000,000
North Shore Intercepting Sewer	550,000
	$4,640,000

The extension of the North Side Sewage Treatment Plant, estimated to cost $1,200,000, probably will not be required until 1945 or later. The lessening of the period of detention of the sewage in the tanks for aeration has greatly increased the capacity of this portion of the plant. Thus with the addition of more final settling tanks now under construction this plant will have sufficient capacity for the next few years.

The contingent item for Miscellaneous Plants and Sewers, reduced to $1,000,000 at the time of the last semi-annual report to the Court, can now be eliminated.

The item of $15,000,000 for South Side Sewers and an item of $1,100,000 for that portion of the Racine Avenue Pumping Station required to handle the discharge of these sewers, must be deferred until some

future time because of financial necessity. The postponement of this work will not affect the reduction in diversion of water from Lake Michigan. The proposed new South Side Sewers comprise a very important sanitary improvement, but their construction would not bring any additional sewage under treatment.

The items eliminated from the program of essential construction work at this time and postponed until some future date have been estimated to cost $22,940,000.

The estimated cost of future essential sewage treatment construction, as of June 1, 1937, is as follows:

TABLE 5.
FUTURE WORK AFTER JUNE 1, 1937.

Calumet Project	$ 2,927,000.00
North Side Project	481,000.00
West Side Project	265,000.00
Southwest Side Project	6,577,000.00
West-Southwest Treatment Plant	20,821,000.00
Chicago River Controlling Works	2,217,000.00
Total	$33,288,000.00

Funds remaining unexpended from the amounts obtained under the agreement of September 21, 1935 with the Federal Emergency Administration of Public Works to the extent of $18,979,000 are available for this future work. This leaves essential work to the extent of $14,309,000 to be financed from other sources. The Sanitary District will apparently be able to finance work to the extent of $1,359,000 now, leaving work estimated at $12,950,000 for which no resources are presently available. The specific items estimated at $12,950,000 are secondary treatment of West Side sewage $12,650,000 and additional sewers

for 100 per cent collection of sewage on the North and West Side areas $300,000.

SEWAGE TREATMENT.

The population of The Sanitary District of Chicago, as of July 1, 1937, is about 4,541,000, according to estimates made from the figures of the 1930 census. The industrial wastes in the Sanitary District are assumed to be equivalent to the sewage of 1,820,000 additional persons. Hence, the total population and industrial wastes equivalent amount to 6,361,000. This figure includes the Corn Products wastes, which would have been equivalent to the sewage of 415,000 persons if no recovery had been accomplished. These wastes have been greatly reduced, as a result of certain experimental work initiated by the Sanitary District.

The 1936 total population, and industrial waste equivalent, as above indicated, are estimated as 6,361,000. Up to date, the Sanitary District has assumed that so-called complete sewage treatment could produce an annual average of 85 per cent purification. Hence, so-called complete treatment for the total July 1, 1937, population and industrial wastes equivalent would equal the 100 per cent treatment of the sewage of 5,406,000, which is 85 per cent of 6,361,000.

The expenditures for sewage treatment have been indicated in Tables 1, 3, and 4. The amounts of actual sewage treatment in operation on December 24, 1936 (as of the time of the last report to the Supreme Court) and at the present time are shown in Tables 6 and 7, following:

TABLE 6.

ACTUAL SEWAGE TREATMENT IN OPERATION AS OF DECEMBER 24, 1936.

Treatment Works	Population Equivalent	Percentage Treatment	Treatment 100 Per Cent Basis
Calumet	304,000	85	258,000
North Side	1,218,000	85	1,035,000
West Side (Sedimentation)	1,612,000	33⅓	537,000
Miscellaneous (Morton Grove, Glenview, Northbrook)	8,000	85	7,000
Corn Products (Reduction)	372,000		350,000
Total	3,514,000		2,187,000

TABLE 7.

ACTUAL SEWAGE TREATMENT IN OPERATION AS OF JUNE 25, 1937.

Treatment Works	Population Equivalent	Percentage Treatment	Treatment 100 Per Cent Basis
Calumet	326,000	85	277,000
North Side	1,235,000	85	1,049,000
West Side (Sedimentation)	1,622,000	33⅓	541,000
Miscellaneous (Morton Grove, Glenview, Northbrook)	8,000	85	7,000
Corn Products (Reduction)	415,000		370,000
Total	3,606,000		2,244,000

The extent of the operation of sewage treatment plants at the present time is equal to the 100 per cent treatment of the sewage of 2,244,000 out of 5,406,000 persons, which would be the present possible 100 per cent treatment if the sewage of the total population and industrial wastes equivalent of 6,361,000 were being treated. This indicates the actual treatment of approximately 41.5 per cent of the total sewage within the Sanitary District, although considerable additional construction work has been performed during this period, for which no credit will be taken in this percentage until the works are completed and put in operation.

DIVERSION OF WATER.

The net diversion of water from Lake Michigan, during the calendar year 1936 averaged 4,862 cubic feet per second. The domestic pumpage of the Chicago metropolitan area during this period averaged 1712 cubic feet per second; the inflow from the Des Plaines River averaged 33 cubic feet per second; and the total flow from the Main Channel at Lockport averaged 6607 cubic feet per second.

Diversion of water from Lake Michigan by The Sanitary District of Chicago since July 1, 1930, has been made in accordance with a Permit from the Secretary of War, dated June 26, 1930, which authorized the diversion of water as specified in the Decree of the Supreme Court, handed down April 21, 1930. This limited the net diversion to an annual average of not more than 6,500 cubic feet per second up to December 31, 1935, and thereafter limits the net diversion to an annual average of not more than 5,000 cubic feet per second up to December 31, 1938. The average monthly diversion, as made under this Permit from January 1 to June 20, 1937, is indicated in the table following:

Month 1937	Total Flow From Main Channel At Lockport C.F.S.	Inflow From Des Plaines River C.F.S.	Domestic Pumpage Chicago Metropolitan Area C.F.S.	Net Diversion From Lake Michigan C.F.S.
January	6348	88	1602	4658
February	5629	32	1635	3962
March	5462	30	1613	3819
April	6350	41	1587	4722
May	5850	31	1590	4229
June 1 to 20..	6700	25	1510	5165
Average	6056	41	1589	4426

All of which is respectfully submitted,

THE SANITARY DISTRICT OF CHICAGO,

By ROSS A. WOODHULL,
President.

WILLIAM H. TRINKAUS,
Acting Chief Engineer.

ERNST BUEHLER,
Attorney.

Attest:

JAMES J. SULLIVAN,
Clerk.